

MISCELLANEOUS.

On the Reproduction of Frogs and Toads without the intermediate stage of Tadpole. By the Rev. L. JENYNS.

To the Editors of the Annals of Natural History.

GENTLEMEN,—I have read with much interest the observations of Mr. Lowe in your last April Number respecting the *occasional* reproduction of Frogs and Toads without the intermediate stage of Tadpole. The facts he mentions call, perhaps, for some further investigation before the conclusions which he draws from them can be considered fairly established. The subject, however, deserves attention; and any other facts that can be adduced of a similar kind may assist in throwing light upon it. I would accordingly just mention that, in my 'Observations in Nat. History' (p. 203), I have recorded the circumstance of toads inhabiting the cellars at Bottisham Hall, from which they can make no escape, but where, nevertheless, they may often be noticed in the spring *in copulâ*, and where I have also seen young toads, though I never noticed any spawn-deposits. I have also alluded, in my 'Manual of British Vertebrate Animals' (p. 305), to the circumstance of specimens of the common Newt or Eft being found on land, as Sheppard had previously remarked, "of all sizes, from 1 to 4 inches in length, but never in any other than a perfect state." Shaw too had noticed the same thing, and regarded it as an argument in favour of this species being viviparous. I was always very much at a loss to account for the presence of these small individuals in places where there was no water within a considerable distance, particularly in one given spot, a damp out-building, where they might constantly be found concealed under stones. My impression at the time was that they must have been bred in the merest puddles caused by rains, which soon drying up obliged them to exchange their native element as *larvæ* for another, before they would have ordinarily attained the perfect form; and that this led to the gills being cast prematurely to enable the animal to accommodate itself to its new circumstances. But I think it more probable now, after what Mr. Lowe has stated in the case of frogs and toads, that these individuals may have been *born on land in the state in which they are found*, and that in fact gills never existed, or disappeared almost immediately after birth.

I am, yours &c.,

L. JENYNS.

Researches on the Fecundation and Formation of the Embryo in the Hepaticæ and Ferns. By H. PHILIBERT.

I. *Hepaticæ*.—1. In the *Hepaticæ* as in the Mosses, the organ called *epigonium* which envelopes the capsule almost until its arrival at maturity is a true ovule, reduced to the nucleus, in which an embryo is developed.

2. This epigonium or nucleus is lined by a membranous embryo-sac.

3. The embryo developed in this ovule is represented by the capsule with its pedicel.

4. The nucleus and the embryo-sac are closed at first and open a little before fecundation.

5. The embryo-sac contains a free vesicle which produces the embryo by its development. This embryonal vesicle exists before the opening of the nucleus and consequently before fecundation.

II. *Ricciæ*.—6. In the *Ricciæ* there exist a nucleus, an embryo-sac, and an embryonal cell exactly like those of the Mosses. This embryonal cell, however, instead of producing a capsule with its pedicel, merely becomes enlarged, and the sporiferous cells are formed immediately in the interior of this membranous sac, which is itself enveloped by the epigonium.

III. *Ferns*.—7. The Ferns have ovules exactly like those of the Mosses and Hepaticæ, also consisting of a nucleus formed of a simple layer of cells and lined internally by an embryo-sac.

8. In the Ferns these ovules are produced on a very simple frond, which is the immediate result of the germination of the spores. The embryo which is formed in these ovules reproduces the original plant, as in the Phanerogamia.

9. The ovule or nucleus of the Ferns is at first closed at the apex and opens for fecundation; it contains before its opening an embryonal cell which produces the embryo by its development.

10. The embryo of the Ferns consists of a primary leaf, a primary root, and a conical base representing the stem or the axis of the plant. The primary root is not a continuation of the stem as in the embryo of the Phanerogamia; it is oblique, and from this character the embryo of the Ferns may be called *plagiorrhizal*.

11. This character still exists in the developed plant. Each leaf has its proper root, which separates almost immediately from the stem, and takes an oblique direction towards the earth.

12. In the Ferns, Mosses and Hepaticæ, the base of the embryo is turned towards the base of the ovule, and the apex towards its summit or *micropyle*; so that it is in a position the reverse of that which it occupies in the Phanerogamia.—*Comptes Rendus*, Dec. 13, 1852, p. 851.

MODE OF DETERMINING THE OPTICAL POWER OF A MICROSCOPE.
BY PROFESSOR HARTING OF UTRECHT*.

The optical power of a microscope may be said to consist of three qualities, viz. magnifying power, defining power, and penetrating power. Although the first is the quality to which most importance is generally attributed, the practised observer well knows that it is of far less consequence than the second and third. And although there

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